

***A Study of  
Class Size and its Effects  
on Learning***

**The Alberta Teachers' Association**

**April 1999**

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# **Class Size and Its Effect on Learning**

Large class sizes are a significant concern for teachers in urban and suburban schools in Alberta, and for an increasing number of parents whose children attend those schools.

Over the past six years the socio-economic revolution in Alberta and its focus on reforming government services have dominated the political agenda. In education the promotion of school choice and the impact of budget cuts have profoundly affected class size in both public and separate schools: school choice has diverted scarce resources from the classroom, while budget cuts made since the 1993 restructuring have seen much less money being allocated to school boards. As a result, boards have not replaced resigning or retiring teachers, and class sizes have increased.

The debate over the impact of class size continues to be waged in Alberta. Increasing qualitative research suggests that, although the quantitative measurements might not always show improvements, they are often too narrowly focused on academic testing to prove particularly worthwhile. Many researchers believe that broadening the measurement criteria to aspects other than academic testing would provide a different picture of the impact of smaller classes.

## **The Teachers' View**

Teachers have a responsibility for the success of all children and there is no doubt in their minds that smaller classes offer the best learning environment. However, any push for reduced class sizes and hiring more teachers immediately comes into conflict with

government, which invariably stresses the importance of spending reductions.

Nevertheless, class size remains an issue for teachers and parents alike. Its significance is highlighted by advertisements from private schools that hope to lure students from the public system with the promise of smaller classes. The attraction of smaller classes is not exclusive to this province or country either. In Britain, “smaller classes are a key factor for more and more parents who choose to send their children to independent schools.”<sup>1</sup>

Reports from the Santa Barbara County school district in California suggest that, as a result of class-size limits established in California’s public schools, “students are leaving private schools and returning to the public schools in great numbers, in large part because parents like the new smaller classes. Westbrook [a California teacher] says her district has had to build new facilities to help accommodate the influx of private school students.”<sup>2</sup>

Teachers believe that students benefit significantly from reduced class sizes in a number of ways.

- ◆ Smaller classes provide better discipline. Smaller classes provide time for more individual attention for each student. Classroom management is more effective when teachers spend more time with each student and keep track of individual progress. Teachers are able to employ a wider variety of instructional strategies,

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Biddy Passmore, “Small classes sway choice of fee-paying parents,” *Times Educational Supplement*, 22 May 1998.

2

Daniel Gursky, “Class size DOES matter,” *Education Digest*, October 1998, pp 15–18, condensed from *American Teacher* 82, April 1998.

methods and learning activities and can be more effective when the class is small. Teachers' attitudes and morale are more positive when they have fewer students. Smaller classes allow optimum use of time and space. Teachers have more time to plan, diversify and individualize their teaching.<sup>3</sup>

In an article in the *Times Educational Supplement*, Elaine Williams neatly sums up the benefits teachers gain from smaller classes:

Teachers of smaller classes spoke confidently about their teaching, about pupils' progress and about their ability to support those with special needs including the most able.

Teachers believe small classes enabled them to vary their teaching methods more, do more practical, hands-on work and provide better quality and a richer environment for pupils while making teaching more enjoyable for the teacher.<sup>4</sup>

Parents also see benefits to smaller classes and are "very eager to have their children in smaller classes, believing that disruptions will be minimized and individual attention maximized."<sup>5</sup>

In the eyes of many teachers in Alberta, the impact of increases in class size might well

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E. Swan et al, *The educational effects of a state supported reduced class size program, PRIME TIME at the North Gibson School Corporation*, Terre Haute, IN., Indiana State University, School of Education, 1985 (ERIC Document Reproduction Service No. ED 276 109).

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Elaine Williams, "Smaller really is better, isn't it?," *Times Educational Supplement*, June 19, 1998.

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Suzanne Ziegler, *Class size, academic achievement, and public policy*, Canadian Education Association, November 1997.

be more serious than politicians believe. If achievement levels fall below satisfactory as defined by Alberta Education, could increasing class sizes be part of the problem? If the drop-out rate and the high school completion rate are not improving as quickly as Alberta Education would like, maybe class size is a factor? Indeed, researchers have determined that larger classes might well increase difficulties at the higher grades, particularly for at-risk, minority, special needs or second-language students. One study contends that large schools cause alienation and lead students to drop out more quickly than they would if they were in smaller classes where they receive more individual attention. The study cites a correlation between school size and the amount of school leaving.<sup>6</sup> The Iowa "School Within School" program, which reaches into the higher grades, concludes that the increased interaction between student and teacher that occurs in smaller classes is of paramount importance in aiding at-risk students.<sup>7</sup> Other research that examined students' lack of responsibility for their own learning in high school science found that large class size was a contributing factor.<sup>8</sup> Finally the engagement and participation that small classes bring could very well increase the feelings of responsibility students require to

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R. J. Altenbaugh et al, *Caring for kids. A critical study of urban school leavers*, Washington DC, Falmer Press. 1995.

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R. Gordon, *School Within a School, Grades 7, 8, 9, 10. Focus on program evaluation*, Iowa, Des Moines Public Schools, 1992 (ERIC Document Reproduction Service No. ED 371 045).

8

M. Erb, *Increasing students' responsibility for their learning through multiple intelligence activities and cooperative learning*, 1996 (ERIC Document Reproduction Service No. ED 400 947).

succeed in school.<sup>9</sup>

Nevertheless, all the evidence of the value of smaller class sizes to the contrary, the Alberta government has actually increased class size by supporting alternative programs and funding private schools.

### **The Alberta Scene**

Class size was an issue in the Calgary public school teachers' strike in 1980. That strike was ended, in part, by the establishment of a fact finding commission to look into working conditions of teachers in Calgary. The commission became known as the Kratzmann Commission after its chair Dr Arthur Kratzmann.<sup>10</sup> The commission made several recommendations, one of which was that class size should be limited to 20 students per teacher. Despite active attempts by the Association to promote this recommendation, it was dismissed by many provincial politicians on the basis that the only research supporting limiting class sizes was American and therefore was not relevant in Alberta<sup>11</sup> and on the somewhat fatuous personal view of one MLA, who noted that he

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J. D. Finn, *Class size and students at risk: what is known? . . . what is next?* Available FTP, Hostname: oeri.ed.gov Directory: pubs/classize/.

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The Kratzmann Commission comprised Dr Arthur Kratzmann, Dr Timothy Byrne and Dr Walter Worth and was established by Alberta Labour. The Commission reported in December 1980 with a document entitled *System in Conflict*.

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John Gogo, MLA Lethbridge-West speaking during the Committee of Supply debate on education, May 4, 1981, recorded in *Alberta Hansard*, page 508.

himself “was a product of 40 or more students in a room.”<sup>12</sup> The Association tried to promote some Alberta-based research on class size—at the 1984 Annual Representative Assembly, then ATA president Arthur Cowley,<sup>13</sup> told the government that the Association itself would fund extra teachers for a one-year experiment with classes of no more than 20 students in a small jurisdiction. Education Minister David King rejected the offer. Since then the issue has remained dormant.

Although statistics provided by Alberta Education reveal that average pupil/teacher ratios<sup>14</sup> in Alberta decreased in the 1980s, going from 25.1:1 in 1981–82 to 20.9:1 in 1984–85 and as low as 20.5:1 in 1989–90,<sup>15</sup> much of this variation was the result of increasing numbers of specialist teachers, such as those needed for special education and reading. Therefore, the reductions in the pupil/teacher ratio did not necessarily translate

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Andrew Little, MLA Calgary-McCall, speaking during the Committee of Supply debate on education, May 4, 1981, recorded in *Alberta Hansard*, page 509.

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Alberta Teachers' Association, President's Report, minutes of the 67<sup>th</sup> Annual Assembly, Calgary 1984.

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“Pupil/teacher ratio” is the number of students in a school or district, in this case in the province of Alberta, compared to the number of teaching professionals. “Class size” means the actual numbers of pupils in a classroom.

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Government of Alberta, *Teachers in Alberta: average pupil/teacher ratio in Alberta*, from Alberta Education's Web site at <http://ednet.edc.gov.ab.ca>.

into smaller class sizes.

Attempts in 1993 to reduce spending on education saw class sizes, particularly in urban areas, begin to increase. Evidence of that increase is shown by the government's own pupil/teacher ratios which stood at 20.5:1 in 1991–92 but rose to 22.7:1 by 1995–96.<sup>16</sup>

Every study or survey undertaken by the Association, its locals and the Canadian Teachers' Federation (CTF) in the last six years has raised class size as a factor affecting the education of Alberta's children.<sup>17</sup> The Association's 1996 *Report Card on Education* reported that 67 percent of the 10,500 teachers who responded believed that their class sizes had increased since 1993 when government changes to education were imposed. Despite this belief, the minister of education continues to deny the negative impact of large class sizes. Indeed, in response to a question in the Alberta legislature, the minister announced that "among red herrings the issue of classroom size is the king of tunas."<sup>18</sup> In response to another question, the minister referred to a report produced by the University

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Ibid and Minister of Education, Question period, August 14, 1996, *Alberta Hansard*, page 2138.

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Various reports including *Trying to Teach* (ATA, 1993), *Trying to Teach: Necessary Conditions* (ATA, 1994), *Results of a Report Card on Education in Alberta* (ATA, September 1996), *Calgary Public Teachers Survey on Working Conditions* (December 1996), *Report #12 to the Edmonton Public Teachers, 1995/96 Enrolment, Staffing and Class Size*, prepared by Noel Somerville (1997), *Canadian Teachers' Federation National Issues in Education Poll: Summary of Major Findings*, September 1998, *Edmonton Public Schools, Community Survey Results 1997/98*, September 1998.

18

Question period, June 4, 1997, *Alberta Hansard*, page 1004.



of Calgary which, he claimed, stated “that variables that have no practical effect on achievements include class sizes.”<sup>19</sup> Such statements only serve to highlight the contrast between the views of parents and teachers and those of the politicians responsible for the education system in the province, who have the tendency to value cost effectiveness—“we also strive to get value for our dollar”<sup>20</sup>—over educational benefits. (This does not explain, however, the 1998 decision by the Alberta government to increase funding to private schools, many of which market themselves by selling the advantages of their small classes.)

## Research

A recent paper on class size produced for the Canadian Education Association by Suzanne Zeigler provides a starting point for examining the research on class size. Zeigler asserts that parents believe “their children will benefit from more individual teacher attention and awareness” and that this will translate into higher scores on achievement tests.<sup>21</sup> This assertion presupposes that parents are concerned only with the measurement

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<sup>19</sup> Question period, June 10, 1997, *Alberta Hansard*, page 1131.

<sup>20</sup> Question period, Minister of Education, April 29, 1997, *Alberta Hansard*, page 259.

<sup>21</sup> Suzanne Ziegler, *Class size, academic achievement and public policy*, Canadian Education Association, November 1997, page 2.

of test outcomes, rather than with the broader aspects of education. Indeed Zeigler proposes that any “ultimate justification for educational innovation or change—especially an expensive one—is that it measurably increases academic achievement.” In Zeigler’s terms, then, the only rationale for investing in more teachers for fewer students is to increase student achievement.<sup>22</sup>

According to the U.S. National Education Association (NEA), perhaps the greatest challenge in the study of class size is that the effects of class-size reduction can only be found by using complex statistical methods.<sup>23</sup> Older studies tend to show little gains in achievement for students in smaller classes; the newer, better controlled studies report significant gains.”<sup>24</sup>

In the introduction to its paper on reducing class size, the United States Department of Education states:

Research and common sense suggest that smaller classes offer teachers the chance to devote more time to each student so as to improve their learning . . . skeptics

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Ibid

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National Education Association, *Class size. What research says about series, number 2, Data-Search Reports*, Washington, DC, NEA Research Division (ERIC Document Reproduction Service No. ED 274 075).

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Thanks for sections of this paper go to Peter Adams, a graduate student at the University of Alberta, who prepared a paper entitled “Class size reduction: a brief review of the research, 1978–98” to assist in the preparation of this position paper, November 1998.

worry that reducing class size will increase costs without producing substantial benefits.<sup>25</sup>

Eric Hanushek of the University of Rochester, who calls class-size reduction a “perennial cornerstone of educational reform,” is a major opponent to class-size reduction as a way of improving public education. According to Hanushek, “for every study that finds that increases in basic school resources promote higher achievement, another study shows just the opposite.”<sup>26</sup> He “repeatedly reviewed the available studies that permit a comparison of various school resource inputs—including class-size reductions—and student outcomes and has concluded that reducing class size should not be expected to produce better student performance. His analyses have found that the relationships between various school expenditures—including class-size reductions—are remarkably weak, leading him to call for a drastic re-thinking of public education policy.”<sup>27</sup>

Hanushek’s view of the impact of class-size reduction contrasts significantly with the

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U.S. Department of Education, *Reducing class size: what do we know?*, May 1998, downloaded from <http://www.ed.gov/pubs>, October 8, 1998.

26

Gerald Bracey, “Research oozes into practice: the case of class size,” *Phi Delta Kappan*, September 1995, pp 89–90.

27

Eric A. Hanushek, “The evidence on class size,” given as public testimony in Washington DC in 1998 and cited in U.S. Department of Education’s *Reducing class size: what do we know?*, May 1998, downloaded from <http://www.ed.gov/pubs>, October 8, 1998.

view of Glass and Smith<sup>28</sup> who consolidated all previous studies on the subject in a purely quantitative study that caused a great deal of controversy when its results were released.

Glass and Smith drew three principal conclusions:

1. Average pupil achievement increases as class size decreases. The typical achievement in instructional groups of 15 or fewer is several percentile ranks above that of pupils in classes of 25 and 30. Achievement increases most dramatically when class size drops below 20.

They also concluded that the relationship between class size and achievement is slightly stronger at the secondary level without regard to differences between subject matter. In a second study, Glass and Smith contended that smaller class sizes can also be associated with a higher quality classroom environment, better student attitudes and greater teacher satisfaction.<sup>29</sup>

Not everyone, however, agrees with Glass and Smith's studies. Alex Molnar points to Robinson and Wittebols' claim that Glass and Smith drew conclusions based on too few

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G. V. Glass and M. L. Smith, *Meta-analysis of research on the relationship of class size and achievement*, San Francisco, Far West Laboratory for Educational Research and Development, 1978 (ERIC Document Reproduction Service No. ED 168 129).

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G. V. Glass and M. L. Smith, *Relationship of Class Size to Classroom Processes, Teacher Satisfaction, and Pupil Effect: A Meta-analysis*, San Francisco, CA, Far West Laboratory for Educational Research and Development, 1979 (ERIC Document Reproduction Service No. ED 190 698).

studies and that they relied too heavily on research on individual tutoring.<sup>30</sup> Molnar also cites Robert Slavin of Johns Hopkins University, who suggested that Glass and Smiths' analysis was flawed because "it did not carefully enough take into account qualitative distinctions between studies . . . and that except for studies of class size of one, [their] evidence that class-size reductions raised achievement was weak."<sup>31</sup>

Despite the differing opinions of scholars and researchers, there are points of agreement between proponents and critics of class-size reduction. Goettler-Sopko provides quite an effective summary of points generally agreed upon by both sides.

- ◆ Smaller class sizes seem to result in higher achievement among students who are economically disadvantaged.
- ◆ Students with lower academic ability seem to do better in smaller classes.
- ◆ Class size might affect student attitudes more significantly than it affects achievement.
- ◆ A direct effect of large classes is to lower the morale and increase the stress of teachers.
- ◆ There is typically little to be gained from reductions in class size that do not bring class size below 30.<sup>32</sup>

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G. E. Robinson and J. H. Wittebols, *Class Size Research: A Related Cluster Analysis for Decision Making*, Arlington, VA, Educational Research Service, Inc. 1986, as cited in Alex Molnar, *Smaller Classes Not Vouchers Increase Student Achievement*, Keystone Research Centre, Harrisburg, PA, 1998.

<sup>31</sup> R. E. Slavin, "Meta-analysis in Education: How it has been used," *Educational Researcher*, 24, 1984.

<sup>32</sup> S. Goettler-Sopko, *The effect of class size on reading achievement* (ERIC Document Reproduction Service No. ED 325 826).

Molnar concludes that “there is no longer any argument about whether or not reducing class size in the primary grades increases student achievement. The research evidence is quite clear; it does.”<sup>33</sup>

## Class-size Reduction Programs

In addition to research projects on the subject, many programs have attempted to measure the impact of class-size reductions. One of the earliest occurred in Toronto in the late 1970s. This study is cited by Ziegler, who explains that “students were randomly assigned to classes of differing sizes in the same schools, and their achievement in core subjects was tested on standardized measures and compared after two or more years in the different classes.”<sup>34</sup> The small classes had 16 students compared to class sizes of 23, 30 and 37.<sup>35</sup> The findings were that “only the classes of 16 students showed an increase in

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A. Molnar, *Smaller Classes Not Vouchers Increase Student Achievement*, Keystone Research Center, Harrisburg, PA, 1998.

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Suzanne Zeigler, *Class size, academic achievement and public policy*, Canadian Education Association, November 1997, page 3.

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S. M. Shapson, E. N. Wright, G. Eason and J. Fitzgerald, “An experimental study of the effects of class size,” *American Educational Research Journal*, 17, 2:141–152, 1980, cited in Suzanne Ziegler’s *Class size, academic achievement, and public policy*, Canadian Education Association, November 1997.

achievement; there was no advantage for classes of 23 or 30 over classes of 37.”

In addition to the Toronto study, many American states have also completed studies on the impact of class size and learning. These American studies are discussed below.

## **Indiana**

In 1981, the Indiana General Assembly appropriated funding for the 1981–82 and 1982–83 school years to reduce the student/teacher ratio in 24 Kindergarten, Grade 1 and 2 classrooms around the state to 14:1.<sup>36</sup> The project was known as PRIME TIME.

Although academic researchers were critical of the design and control of this program, the reported results were impressive. According to Bain and Achilles, there were three important findings:

- ◆ Students in classrooms with pupil/teacher ratios of 14:1 scored higher on standardized tests than students in larger classes.
- ◆ Students in the smaller classes had fewer behavioral problems than their counterparts in larger classes.
- ◆ The teachers of the smaller classes reported that they were more productive and

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<sup>36</sup>

H.P. Bain and C.M. Achilles, “Interesting developments on class size,” *Phi Delta Kappan*, May 1986, pp 662–65.

efficient than they had been when they were teaching larger classes.<sup>37</sup>

In 1984, the Indiana General Assembly appropriated funds to permit the reduction of class size in Grade 1 classrooms across the state, although only to support a ratio of 18:1.

## **Tennessee**

The most significant study to date on class size is Project STAR, the Student-Teacher Achievement Ratio project. This is a longitudinal research study begun in Tennessee in 1985, preceded by a one-year study in 1984 at Tennessee State University's Center for the Teaching of Basic Skills to the Economically and Educationally Disadvantaged. Project STAR was initially funded by the Tennessee legislature for four years and was devised as a very tightly controlled experiment to avoid academic criticism. Nonetheless, as late as the 1998 annual meeting of the American Educational Research Association, an attempt was made to discredit the statistical analysis in the Project STAR, although the critic ultimately conceded the statistical strength of the study.<sup>38</sup>

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Ibid

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The paper entitled *Tennessee's class size study: Questions answered, questions posed* was presented by J. D. Finn and C. M. Achilles at the annual meeting of the American Educational Research Association, San Diego, April 1998, and the discussion is reported in *Latest on class size from AERA* by C. Naylor, one of the Occasional Series of Reports on presentations at the AERA, San Diego, April 1998.



In the initial project, 79 schools in 42 school systems in Tennessee were chosen at random to take part. Each of these schools had at least one class of 13 to 17 students (a total of 128 classes), one class of 22 to 25 students with a full-time aide (a total of 99 classes), and one class of 22 to 25 students without an aide (a total of 101 classes). Bain and Achilles outline the research:

The researchers are studying several student variables: 1. achievement in mathematics and reading, as measured by the Stanford Achievement Test; 2. mastery of the reading/language arts and mathematics objectives established under the Basic Skills First program; 3. self-concept, as measured by the Self-Concept and Motivation Inventory; 4. attendance rates; and 5. retention rates. To determine whether such variables contribute to pupil achievement, the researchers will also study the educational background and experience level of teachers and aides, the instructional methods used, and teacher morale and attendance.<sup>39</sup>

The initial results of Project STAR are impressive. The overall conclusion was that students in smaller classes significantly outperformed students in regular-sized classes and regular-sized classes with a teacher's aide.<sup>40</sup> The achievement gains reported were without any intervention other than the reduction in class size—no special teacher

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H.P. Bain and C.M. Achilles, "Interesting developments on class size," *Phi Delta Kappan*, May 1986, pp 662–665.

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E. Word et al, *Student/Teacher Achievement Ratio (STAR) Tennessee's K–3 Class Size Study. Final summary report, 1985–1990*, 1990 (ERIC Document Reproduction Service No. ED 320 0692).

inservice or change to the curricula occurred. The positive effects of the small class applied regardless of the children's gender, race, or socioeconomic status. In addition, a high level of student engagement and fewer discipline problems were cited. Subsequent follow-up studies in Tennessee, under the Lasting Benefits Study, tracked students who had participated in project STAR on their return to regular-sized classes. To date findings include:

- ◆ In fourth grade, students from the small classes still outperformed the students from larger classes in all academic subjects.
- ◆ In fourth grade, students from the smaller classes were better behaved than students from the larger classes (that is, in terms of student classroom effort, initiative and disruptiveness).
- ◆ At least through eighth grade, a decreasing but still significant higher academic achievement level for the students from the smaller classes persists.<sup>41</sup>

### **North Carolina**

A class-size reduction project was introduced in 1990 in Burkes County, North Carolina. The goal was to reduce class size to 15 students in all Grade 1, 2 and 3 classes. In comparison to larger classes that had not initially been phased into the study, smaller classes outperformed the comparison group at all levels in reading and mathematics tests.

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U.S. Department of Education, *Reducing class size: what do we know?*, May 1998 downloaded from <http://www.ed.gov/pubs>, October 8, 1998.

Other positive observations from the project included expanded classroom space, improved classroom management, strengthened instruction and assessment, enhanced student concept and relationships with peers and improved teacher–parent communication.<sup>42</sup>

## **Texas**

In a significant analysis of the Texas education system, Ronald Ferguson found that “empirical results reveal a complex pattern but one that is more consistent with conventional wisdom among educators than the findings of most past studies.” He also found significant relationships between teacher quality, class size and student achievement. Using data from more than 800 districts representing over 2.4 million students in Grades 1 through 7, and using student/teacher ratio as a measure of class size, Ferguson found that student achievement fell as the student/teacher ratio increased for every student above an 18 to 1 ratio. He also found that measures of teacher quality (teacher literacy skills and professional experience) and students’ socio-economic status

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P. Egelson et al, *Does class size make a difference? Recent findings from state and district initiatives*, Tallahassee, FL, Southeastern Regional Vision for Education (SERVE), 1996 (ERIC Document Reproduction Service No. ED 400 947).

were even more strongly related to high student scores.<sup>43</sup>

## **Nevada**

In 1989 the state of Nevada passed the Class Size Reduction Act which called for a reduction of the student/teacher ratio for classes from Kindergarten through Grade 3. The evaluation of that project was released in 1995. The first part of the evaluation, which examined changes in comprehensive test scores, concluded that students in the smaller classes improved their performance in mathematics and reading. However, the study also found that other factors, such as special education status, ethnicity, free lunch eligibility and English as a Second Language status, were more important factors in achievement than the reduction in class size.

In the second part of the study, a survey was conducted of all Nevada elementary school principals, teachers of all Grade 1 and 2 students and parents of students in the class-size reduction project. The survey found a favorable response to the program.

One interesting note in the Nevada study was that class-size reduction meant that fewer students were referred to special education because the teacher had more time to address

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Ronald F. Ferguson, "Paying for public education: New evidence on how and why money matters," *Harvard Journal on Legislation* 28(2), 1991, pp 465–98.

individual needs. This, in turn, saved money.<sup>44</sup> While this area needs more study, the implication is that able teachers, when faced with smaller classes, may have the time required to deal with special education students within their own classrooms.

## **Wisconsin**

In 1996–97, the state of Wisconsin began its own class-size reduction program entitled the Student Achievement Guarantee in Education (SAGE). While primarily concerned with serving students from low-income families, the aim of SAGE is to eventually reduce class size in Kindergarten to Grade 3 to a pupil/teacher ratio of 15:1 or less. Initial results show that students from the smaller classes outperform the control group in various areas of the Comprehensive Test of Basic Skills. It should be noted, however, that class-size reduction was accompanied by the introduction of a rigorous academic curriculum, a provision for before- and after-school activities for students, and a professional development and accountability program. The first year results of the research show that in the SAGE classrooms

- ◆ little time is required to manage the class or to deal with discipline problems;
- ◆ much time is spent on instruction and active teaching;

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D. C. Illig, *Reducing class size: a review of the literature and options for consideration*, Sacramento, CA, California State Library, California Research Bureau (ERIC Document Reproduction Service No. ED 407 699) as cited in Peter Adams, *Class size reduction: a brief review of the research, 1978–98*, prepared for the Alberta Teachers' Association, November 1998.

- ◆ a large portion of instruction is individualized and spent in diagnosing student needs, providing help and in monitoring progress; and
- ◆ students show increases in on-task and active-learning behaviors over the year.<sup>45</sup>

## **Alabama**

The Alabama Board of Education has voted to lower the size of all K–12 classes in the state. The Board approved new student/teacher ratios to be phased in during January 1998 for K–6 and in September 1998 for Grades 7–12. Kindergarten to Grade 3 classes will contain no more than 18 students; Grade 4 to 6 will have no more than 26 students; and the limit in Grades 7 to 12 will be 29 students per teacher.<sup>46</sup>

## **California**

In the 1996–97 school year, California began its class-size reduction program. Through this program the state is giving money to school districts for the purpose of reducing the pupil/teacher ratio in Kindergarten through Grade 3 to 20:1. In the 1997–98 school year, 1.9 million children were assigned to smaller classes in California schools. Additionally California school districts hired 18,000 new teachers; unfortunately, almost one quarter of

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<sup>45</sup> A. Molnar, *Smaller Classes Not Vouchers Increase Student Achievement*, Keystone Research Center, Harrisburg, PA, 1998.

<sup>46</sup> “Alabama shrinks class sizes,” *Education Week*, September 24, 1997.

those teachers lacked teaching credentials, thus lending credence to the skeptical views of those who consider class reduction a gimmick and bemoan the throwing of money at education only to get questionable results. Implementation of class-size reduction policies on a large scale require careful planning and attention.<sup>47</sup> Daniel Gursky reports that “unfortunately, although California mandated an evaluation of the class-size reduction effort, money for the evaluation was never provided, so there’s no good data on its impact.”<sup>48</sup>

There is one other study which is worth mentioning. In 1997, Harold Wenglinsky of the United States Educational Testing Service analyzed school spending patterns and math achievement of Grade 4 and Grade 8 students on the National Assessment of Educational Progress. The study showed that increased student/teacher ratios, interpreted as small class sizes, raised achievement at both grades. Students in the fourth grade in smaller-than-average classes were about half a year ahead of their counterparts in

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U.S. Department of Education, *Reducing class size: what do we know?* May 1998, downloaded from <http://www.ed.gov/pubs>, October 8, 1998.

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Daniel Gursky, “Class size DOES matter,” *Educational Digest*, October 1998, pp 16–18, condensed from *American Teacher* 82, April 1998.

larger-than-average classes.<sup>49</sup>

To date more than “27 U.S. states have either passed legislation reducing class sizes, have debated the topic seriously or are testing the impact of smaller class sizes.”<sup>50</sup>

## Research Findings

### **Advantages of Reduced Class Sizes**

The results of the Tennessee STAR project suggest that there is no longer any argument as to whether or not reducing class sizes in primary grades below a specific level increases student achievement. Whether class-size reduction is the only or the most cost-effective method of producing such results, however, is discussed later.

As well as support from teachers and parents, surveys suggest that taxpayers will also support smaller classes “and are often willing to support financial increases to the schools when they can see the direct result in smaller classes.”<sup>51</sup>

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Daniel Gursky, “Class size DOES matter.” As above.

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“States think small on infant classes,” *Times Educational Supplement*, May 1, 1998. Page 21.

51

Ibid



Smaller class sizes are particularly beneficial for low-achieving, low-income students in the earlier grades and also, as shown in the Wisconsin and Tennessee studies, appear to narrow the achievement gap between Caucasian and minority students.

Ziegler, perhaps rather cynically, suggests that the primary reason for teachers' interest in reduced class sizes, in addition to increased teaching effectiveness, is that "they have fewer students to monitor, fewer pieces of work to evaluate, fewer report cards and parent conferences to prepare, and presumably more manageable classes." She concludes by suggesting that when it comes to class size as a political issue, "the academic payoff is small, but the political one may be large."<sup>52</sup>

### **Concerns About Class-size Reduction**

The primary concern of those opposed to class-size reduction as a way of improving student achievement is clearly that it is "an expensive luxury which society cannot afford" and indeed it may well not be the most efficient or cost-effective way of improving student achievement. Before any major move is made to reduce class size, many critics believe that prospective results should be weighed against the cost of intervention and that questions should be asked about alternative strategies that might be more cost

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Suzanne Ziegler, *Class size, academic achievement and public policy*, Canadian Education Association, November 1997.

effective. While the lack of funding might be a socio-economic reality, it frustrates many practitioners and researchers. Some take a very principled stance believing that if small class size does improve achievement, then cost should be no obstacle.<sup>53</sup> Others suggest that, if it is the schools' responsibility to teach values to children, then society must ensure that adequate funding is directed into the public schools.<sup>54</sup> A study of Illinois public schools concluded that class size is best determined by making the class meet student needs. The researcher suggests that adequate funding for smaller classes provides improved student learning and assists in future life achievement.

Recent analysis of educational spending has indicated that existing programs benefitting at-risk children are the most cost effective and show the most significant promise for student achievement . . . greater investment in education not only provides improved student learning, but also assists in future life achievement.<sup>55</sup>

Some suggest that reducing class size is relatively cost effective compared to the costs of

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P. A. Costello, *The effectiveness of class size on reading achievement*, 1992 (ERIC Document Reproduction Service No. ED 400 035).

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M. Erb, *Increasing students' responsibility for their learning through multiple intelligence activities and cooperative learning*, 1996 (ERIC Document Reproduction Service No. ED 400 947).

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J. Clarke, *Resources to fix schools: the necessities for educating children in Illinois*, Chicago, IL, Chicago Urban League (ERIC Document Reproduction Service No. ED 404 412).

dropouts and remedial education.<sup>56</sup> Barbara Nye argues that “smaller classes will cost less in the long run because you’ll have fewer kids achieving at low levels.”<sup>57</sup> In addition “some research suggests that small classes in the primary grades begin students on a path that reduces the need for special education, grade retentions or disciplinary measures and increases the likelihood of high school graduation.”<sup>58</sup> In other words, cost effectiveness that focuses on immediate gains in test scores misses the point—the real effectiveness is properly measured by reference to long-term societal costs.

Ziegler argues that many jurisdictions simply cannot fund or maintain funding over time for small classes [17:1 or less]. She also questions whether the statistical improvements in the mathematics and science results are worth the expense and indeed whether the improvement is maintained once the students return to regular classes. She questions whether reducing class size is the most cost-efficient way of improving achievement and

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Gerald W. Bracey, “Research oozes into practice: the case of class size,” *Phi Delta Kappan*, September 1995, pp 89-90.

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Noah Lang, “Small classes, big results,” *NEA Today*, October 1995.

58

Joan McRobbie, Jeremy D. Finn and Patrick Harman, *Class size reduction: lessons learned from experience*, Policy brief No. 23, WestEd, San Francisco, August 1998.

she suggests some alternatives, acknowledging that they too have cost implications.<sup>59</sup>

Three of these research-based alternatives include providing

- ◆ peer tutoring or cooperative learning;
- ◆ cross-age reading groups, which “are very helpful for reading instruction in Kindergarten through Grade three and can be achieved without additional teaching staff”; and
- ◆ tutoring for individual children who most need assistance. This method has proven to be two to four times more effective than the average impact of reducing classes to 17 or fewer students. It is important to note, however, that such tutoring programs need trained teachers and are simply not as effective with paraprofessionals.<sup>60</sup>

Acknowledging that hiring more teachers and creating more classrooms are expensive ways to gain the benefits of smaller classes, some researchers suggest other ways to fund class-size reductions. One suggestion is to target the resources; that is, direct the funds to the schools that need it most, particularly those serving poor and/or minority students.

Other suggestions include allowing flexibility in local jurisdictions so that money can be redistributed to provide smaller class sizes and the use of creative scheduling in schools

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<sup>59</sup>

Suzanne Ziegler, *Class size, academic achievement and public policy*, Canadian Education Association, November 1997.

<sup>60</sup> R. Slavin, “Class size and student achievement: is smaller better?,” *Contemporary Education* 62,1, pp 6–12.

thus providing reduced class sizes for a portion of the day.<sup>61</sup> No research has been conducted to determine whether such alternatives are as effective as simple class-size reduction but financial constraints in many cases call for possible alternatives to at least be considered.

## Cautions

There are some very basic concerns in the research about class-size reduction.

The first relates specifically to terminology. It is important to use the term "class size" and not "pupil/teacher ratio." The concerns are related to the actual class-size situation and not simply to an across-the-board, district-wide ratio of students to professional teachers, which may or may not translate into smaller class sizes. Molnar suggests that "average class size is a better indicator of the overall classroom experience of most teachers and most students than is the pupil-teacher ratio."<sup>62</sup>

The second caution is that simply lowering class sizes to below 30, a practice currently being proposed in the Britain, will have minimal impact. The research suggests that only

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<sup>61</sup>

J. McRobbie, J. D. Finn, D. Harman, *Class size reduction: lessons learned from experience*.

<sup>62</sup>

A. Molnar, *Smaller Classes Not Vouchers Increase Student Achievement*, Keystone Research Center, Harrisburg, PA., 1998.

when class sizes are at 17:1 or less will the full impact be felt.<sup>63</sup>

A third caution is that large scale efforts to reduce class sizes are not without perils. The California example raises the issue of sufficient numbers of qualified teachers to fill the various positions, and adequate facilities to contain the increased number of classrooms.<sup>64</sup>

However, class-size reduction that does not use more teachers is not clear class-size reduction at all; it is, in reality, differentiated staffing and that is quite different, and as Word pointed out, it is nowhere near as effective.<sup>65</sup>

In addition, as is noted throughout the research, in order to achieve maximum impact, class-size reduction should be used in conjunction with other strategies. “[t]he benefit to be gained from reducing class sizes is unlikely to be marked unless teachers change their style of teaching to exploit the opportunities of smaller groups.” Thus “planned

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This statement is supported by Suzanne Ziegler, *Class size, academic achievement and public policy*, Canadian Education Association, November 1997; by U.S. Department of Education, *Reducing class size: what do we know?* May 1998; and by Joan McRobbie, Jeremy D. Finn and Patrick Harman, *Class size reduction: lessons learned from experience*, Policy Brief No. 23, WestEd, San Francisco, August 1998.

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Daniel Gursky, “Class size DOES matter,” *Education Digest*, October 1998, condensed from *American Teacher* 82, April 1998.

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E. Word et al, *Student/Teacher Achievement Ratio (STAR) Tennessee's K-3 Class Size Study, Final summary report 1985-1990*, 1990 (ERIC Document Reproduction Service No. ED 320 0692).

reductions in class size should be accompanied by a review of teaching methods, classroom management and inservice training in order to capitalize on the opportunity to enhance student learning.”<sup>66</sup> One additional caution raised by both the Nottingham study and the U.S. Department of Education report is that it is just as important to look at the adverse effects of increased class size, as it is to consider the benefits. While it seems that scholars and researchers intuitively support class-size reduction, the value of the intervention based on cost and the true gains in achievement throughout K–12 school years continue to be debated.

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Executive summary, *Class size research and the quality of education*, a project commissioned by the National Association of Head Teachers with the Centre for Teacher and School Development at the School of Education, University of Nottingham, downloaded from <http://acorn.educ.nottingham.ac.uk>, June 27, 1998.

# **A Study of Class Size and its Effect on Learning**

## **Executive Summary**

The debate over class size has been waged in Alberta for decades. It came to the fore in 1980 during the Calgary public teachers' strike and was the subject of one of the recommendations of the Kratzmann Report. It has again become the subject of debate as a result of the many attempts in the United States, in particular, to improve the public education system.

The teachers' view of class size has always been very clear. Teachers believe that smaller classes "provide better quality and a richer environment for pupils, while making teaching more enjoyable for the teacher."

The research into class size in the United States has been substantial. Most of the studies have attempted simply to use test results as a measure of the effectiveness of class size. However, there does appear to be some consensus, that

- smaller class sizes result in higher achievement among students who are economically disadvantaged
- students with lower academic ability seem to do better in smaller classes
- class size might affect student attitudes more significantly than it affects achievement.

Class reduction programs can be cited throughout the U.S., though the most documented is the Tennessee STAR Project, the Student-Teacher Achievement Ratio project. This study indicates that class size is effective in classes of less than 17 students to a teacher. Was the STAR project a success? The very latest research released April 29, 1999, states "that students in smaller classes outperform their peers in larger classroom settings." The 10-year Tennessee study shows that "students in classes of 13 to 17 have better grades, higher graduation rates, and are more likely to attend college."

The research findings, while suggesting that teachers and parents support lower class sizes, also point to the fact that in order to achieve maximum impact "class-size reduction should be used in conjunction with other strategies." These would include a review of teaching methods, classroom management and inservice training. Simply reducing class sizes without having sufficient qualified teachers, or not reducing class size far enough to have a clear impact simply does not make a difference.





# News Release

The Alberta Teachers' Association

Release Date 1999 05 11

## Alberta teachers study class size and its effects on learning

A wealth of research proves what teachers have known all along—smaller class sizes help provide better quality education and a richer environment for pupils while making teaching more enjoyable for the teacher, says Alberta Teachers' Association president Bauni Mackay.

Mackay was responding to Education Minister Gary Mar's recent release of an "examination of research" indicating that class size has little to do with student performance. Mackay noted that the research into class size has been substantial in the US and there is consensus that smaller class sizes result in higher achievement among students who are economically disadvantaged.

"This research also shows students with lower academic ability seem to do better in smaller classes," said Mackay. "Class size might also affect student attitudes more significantly than it affects achievement."

Class-reduction programs can be cited throughout the US; however, the most documented is the Tennessee STAR Project, the Student-Teacher Achievement Project. This study indicates that class size is effective in classes of 17 students or fewer to a teacher. The latest research on the STAR Project, released April 29, 1999, states "students in smaller classes outperform their peers in larger classroom settings." The 10-year Tennessee study shows that "students in classes of 13 to 17 have better grades, higher graduation rates and are more likely to attend college."

Mackay invited Mr Mar to sit down with her to review and discuss this substantial research. "Teachers have the same goals as the education minister—achieving excellence in public education. We need to work as partners in education," said Mackay.

"Teachers know that class size alone is not the only way to achieve student success. To achieve the maximum impact, class-size reduction needs to be used with a review of teaching methods, classroom management and inservices," said Mackay. "Simply reducing class size without having sufficient qualified teachers or not reducing class size far enough to have a clear impact does not make a difference."

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For more information or for a copy of the Alberta Teachers' Association *Study of Class Size and Its Effects on Learning*, please call Bauni Mackay at 447-9423 (in Edmonton) or 1-800-232-7208 (from elsewhere in the province).

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